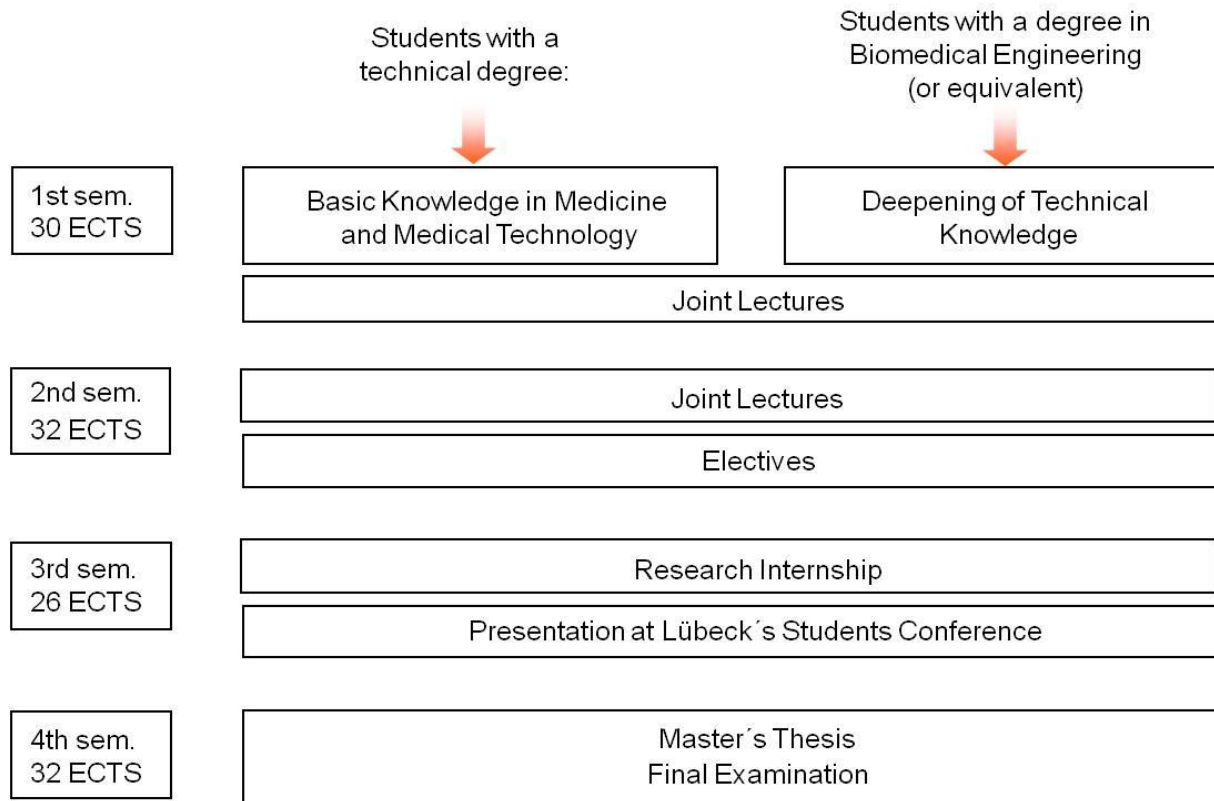




## Joint Master's Program Biomedical Engineering: Structure and Curriculum



Required Courses 1 <sup>st</sup> Semester, Group I				
Students holding a degree in Electronics, Information Technology, Mechanical Engineering, Mechatronics, Physics, Process Engineering, Material Technology or equivalent				
Courses	1 <sup>st</sup> Semester (Hours per week)		Creditpoints	Examination (type, duration)
	L	P		
<b>X4M 1000 - Medicine</b>			<b>8</b>	
X4M 1010 - Anatomy	2			A1-90 min.
X4M 1020 - Medical Microbiology and Hygiene	2	2		A1-90 min.
X4M 1030 - Physiology	2			A1-90 min.
<b>X4M 1100 - Natural Sciences</b>			<b>6</b>	
X4M 1110 - Biomechanics	2			A1-90 min.
X4M 1120 - Biophysics	2			A1-90 min.
<b>X4M 1200 - Medical Technology</b>			<b>8</b>	
X4M 1210 - Medical Technology	4			A1-90 min.
X4M 1220 - Medical Technology - Lab.		2		B
<b>X4M 1300 - System Theory</b>			<b>8</b>	
X4M 1310 - Signals and Systems in Medical Imaging	2			A2
X4M 1320 - Signals and Systems in Medical Imaging Lab.		1		B
X4M 1330 - Numerical Methods in Medicine	2			A1-90 min.
<b>Total 1<sup>st</sup> Semester</b>	<b>23</b>		<b>30</b>	

Required Courses 1 <sup>st</sup> Semester, Group II				
Students holding a degree in Biomedical Engineering, Medical Technology or equivalent				
Courses	1 <sup>st</sup> Semester (Hours per week)		Creditpoints	Examination (type, duration)
	L	P		
<b>X4M 1500 - Signal Processing</b>			<b>6</b>	
X4M 1510 - Signal Processing	2			A2
X4M 1520 - Signal Processing - Lab.		2		B
<b>X4M 1600 - Electronics and Optics</b>			<b>8</b>	
X4M 1610 - Medical Electronics	2			A1-90 min.
X4M 1620 - Medical Electronics - Project		4		B
X4M 1630 - Photonics I	2			A1-90 min.
<b>X4M 1700 - Design Engineering<sup>1</sup></b>			<b>8</b>	
X4M 1710 - Design Methodology	2			A2
X4M 1720 - Design Methodology - Project		2		B
X4M 1730 - Materials Science	4			A1-90 min.
<b>X4M 1300 - System Theory</b>			<b>8</b>	
X4M 1310 - Signals and Systems in Medical Imaging	2			A2
X4M 1320 - Signals and Systems in Medical Imaging Lab.		1		B
X4M 1330 - Numerical Methods in Medicine	2			A1-90 min.
<b>Total 1<sup>st</sup> Semester</b>	<b>25</b>		<b>30</b>	

Required Courses 2 <sup>nd</sup> Semester (all students)				
Courses	2 <sup>nd</sup> Semester (Hours per week)		Creditpoints	Examination (type, duration)
	L	P		
<b>X4M 2000 - Clinical Application</b>			<b>3</b>	
X4M 2010 - Clinical Application of Medical Technology - Project	2	2		B
<b>X4M 2100 - Imaging</b>			<b>8</b>	
X4M 2110 - Imaging	2			A1-90 min.
X4M 2120 - Image Processing	2			A1-90 min.
X4M 2130 - Numerical Methods in Medicine – Lab		2		B
<b>X4M 2200 - Management</b>			<b>6</b>	
X4M 2210 - Regulatory Affairs	2			A1-90 min.
X4M 2220 - Scientific writing		1		B
X4M 2225 - Elective from list II	2			A
<b>X4M 2300 - Electives I</b>			<b>15</b>	
Electives from list I, overall 10 hours per week	10			each A
<b>Total 2<sup>nd</sup> Semester</b>	<b>25</b>		<b>32</b>	

<sup>1</sup> Only for students who received their Bachelor's degree in "Biomedizintechnik" at the FH Lübeck: The module "Design Engineering" can be substituted by the module "Medical Technology". Please, contact the study coordinator within the first 4 weeks.

Required Courses 3 <sup>rd</sup> Semester			
		Creditpoints	Examination (type, duration)
X4M 3000 - Research Internship/s (one project or two projects of 2 months each)	<b>total 4 months</b>	<b>20</b>	B
X4M 3100 - Attendance at Lübeck's Students Conference		<b>6</b>	B
<b>Total 3<sup>rd</sup> semester</b>		<b>26</b>	

Required Courses 4 <sup>th</sup> Semester			
		Creditpoints	Examination (type, duration)
X4M 6000 - Master's Thesis	<b>6 months</b>	<b>30</b>	A
X4M 8000 - Final examination		<b>2</b>	A2-60 min.
<b>Total 4<sup>th</sup> semester</b>		<b>32</b>	
<b>Total study</b>	<b>48/50</b>	<b>120</b>	

Electives	2 <sup>nd</sup> Semester		
	Hours per week		Examination (type, duration)
	L	P	
<b>List I of Electives</b>			
<ul style="list-style-type: none"> <li>X4M 2305 - Design of Medical Electronic Devices</li> <li>X4M 2310 - Computer Aided Techniques in Design</li> <li>X4M 2315 - Biophysics - Laboratory</li> <li>X4M 2320 - Human Biochemistry / Medical Biotechnology</li> <li>X4M 2325 - Medical Technology - Selected Topics</li> <li>X4M 2330 - Computer Vision</li> <li>X4M 2335 - Photonics II and Laser Applications</li> <li>X4M 2340 - Medical Robotics</li> <li>X4M 2345 - Specialized Biomechanics</li> <li>X4M 2350 - Artificial Intelligence*</li> <li>X4M 2355 - Anaesthesia and Artificial Respiration</li> <li>X4M 236X - Other lectures/labs upon approval of the examination committee</li> </ul>	2	4 2 2 2 2 2 2 1 2 2	each A
<b>List II of Electives</b>			
<ul style="list-style-type: none"> <li>X4M 2230 - Health Technology Assessment</li> <li>X4M 2235 - Innovation Management and Marketing</li> <li>X4M 2240 - Quality Management in Healthcare</li> <li>X4M 2245 - Successful negotiation and communication</li> </ul>	2 2 2 2		each A

**Abbreviations / Notes / Footnotes**

\* only offered during the winter term

Examinations: A1: written examination; mark will be taken into consideration for the final grade  
A2: oral examination; mark will be taken into consideration for the final grade  
B: mark will not be taken into consideration for the final grade